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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,046	12/03/2004	Melody A. Wilk	3167R-01	1193
26645	7590	12/10/2007		
THE LUBRIZOL CORPORATION ATTN: DOCKET CLERK, PATENT DEPT. 29400 LAKELAND BLVD. WICKLIFFE, OH 44092				
			EXAMINER SEIFU, LESSANEWORK T	
			ART UNIT 1797	PAPER NUMBER
			MAIL DATE 12/10/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/517,046

Applicant(s)

WILK ET AL.

Examiner

Lessanework T. Seifu

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/03/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 24 is objected to because of the following informalities: In claim 24, page 7, line 6, there is a typographical error. The term "emtal" should evidently be corrected to -metal-.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3, 4-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roby et al. (US 5,726,132).

Regarding claims 1, 4-9, and 20, Roby et al. disclose a method of lubricating an internal combustion engine, the method comprising:

(A) selecting a lubricating oil composition comprising: a base oil, including natural and synthetic lubricating oils (see col. 34, lines 26-30); an alkali or alkaline earth metal-containing detergent; a metal salt of one or more phosphorus-containing compounds represented by the formula (I) as recited in claim 1, wherein the metal used in the metal salt include zinc (see col. 18, lines 31-35), wherein in formula (I), X^1 and X^2 are independently O or S, and R^1 and R^2 are independently hydrocarbyl groups including alkyl, alkenyl and aromatic groups, and wherein R^1 and R^2 independently have from about 1 to about 50 carbon atoms (see col. 2, lines 9-33, col. 3, lines 30-50, and col. 15, lines 20-40). The above disclosure clearly encompasses applicants claim limitation of the average total number of carbon atoms in R^1 and R^2 for the one or more phosphorous-containing compounds being at least 10.4. The above disclosure also encompasses the recited limitation in claim 9, wherein at least 80% by weight, which reads on 100%, of the phosphorus present in the lubrication oil composition being

present in a compound represented by formula (I) wherein R¹ and R² are independently 6 to about 18 carbon atoms.

Applicants' claimed limitation of up to about 40 percent of all the R¹ and R² groups supplied by the phosphorus-containing metal salt containing 4 or fewer carbon atoms, reads on zero percent containing 4 or fewer carbon atoms. Accordingly, the limitation is construed as an optional feature which does not further limit the claim.

Roby et al. further disclose the lubricating oil composition comprising: an acylated nitrogen containing compound having at least about 10 aliphatic carbon atoms and a total base number which falls within applicants' claimed range (see col. 7, lines 40-50 and Example B-3, last line). Roby et al. further disclose the lubricating oil composition being characterized by a phosphorus concentration of up to about 0.12% by weight, in one embodiment up to about 0.08% by weight (see col. 36, lines 48-50). Regarding the claimed limitation to the substantial absence of copper, since Roby et al. do not disclose copper being present in their final lubricating oil composition, it can be construed that copper is substantially absent from their lubricating oil composition.

(B) Adding the lubricating oil composition to the engine (see claim 43).

(C) Operating the engine (see claim 43).

With respect to applicants' limitation to the process step of (D), since, as shown above, Roby et al. have disclosed a lubricating oil blend within the scope of applicant claimed lubricating oil composition, a lubricating oil composition blended according to

the teachings of Roby et al. would possess characteristics, comparable to applicants claimed invention. This is to say that an engine lubricated with a lubricating oil composition blended according to the teaching of Roby et al, would be capable of generating a lean-phosphorous containing gas.

With respect to applicants' claimed limitation to the process step of (E), the limitation is not a patentable distinction over the prior art, as it is well known in the art to equip an internal combustion engine with an emissions control system equipped with a catalyst containing exhaust gas after treatment device, such that the catalyst is contacted with the exhaust gas generated when operating the engine.

Regarding claim 3, Roby et al. disclose an embodiment wherein the lubricating oil composition has a viscosity of 10.7 mm²/s (cSt) at 100⁰C (see co. 44, lines 5-12).

Regarding claims 10-12, Roby et al. disclose that the alkali or alkaline earth metal-containing detergent is a salt of an organic sulfur acids, carboxylic acids, or phenols (see col. 21, lines 45-50). Roby et al. further disclose that the alkali or alkaline earth metal-containing detergent as being a salt of a linear oligomer or polymer containing unsubstituted or substituted phenol units and unsubstituted or substituted salicylic units (see col. 24, lines 35-55), and wherein the alkali or alkaline earth metal includes sodium, lithium or calcium (see col. 26, lines 1-4).

Regarding claims, 13 and 14, Roby et al. disclose that the acylated nitrogen-

containing compound can be derived from a carboxylic acylating agent and at least one amino compound containing at least one -NH- group, the acylating agent being linked to the amino compound through an imido, amido, amidine or salt linkage (see col. 7, lines 41-65); and wherein the acylated nitrogen containing compound is a polyisobutene substituted succinimide (see col. 8, lines 45-59, and claim 15).

Regarding claim 15, Roby et al. disclose that the lubricating oil composition can further comprises a dispersant, corrosion-inhibiting agent, antioxidant, viscosity modifier, dispersant viscosity index modifier, pour point depressant, friction modifier, anti-wear agent, extreme pressure agent, fluidity modifier, anti-foam agent, etc. (see col. 36, lines 59-65).

Regarding claim 16, Roby et al. disclose magnesium as one of several preferred alternatives that can be used as the alkali or alkaline earth metal in their disclosed lubricating oil composition. Roby et al. however do not disclose magnesium being an essential component in their disclosure except as being one of four alternatives that are especially useful as the alkali or alkaline earth metal. Accordingly, it can be construed that Roby et al's disclosure include lubricant compositions wherein magnesium is substantially absent.

Regarding claim 17, Roby et al. disclose a method of lubricating an internal combustion engine, the method comprising:

(A) selecting a lubricating oil composition comprising: a base oil, including natural and synthetic lubricating oils (see col. 34, lines 26-30); an alkali or alkaline earth metal-containing detergent, the alkali or alkaline earth metal including sodium, lithium or calcium (see col. 26, lines 1-4); a metal salt of one or more phosphorus-containing compounds represented by the formula (II) as recited in claim 17, wherein the metal used in the metal salt include zinc (see col. 18, lines 31-35), wherein in formula (II), X^1 and X^2 are independently O or S, and R^1 and R^2 are independently hydrocarbyl groups including alkyl, alkenyl and aromatic groups, and wherein R^1 and R^2 independently have from about 1 to about 50 carbon atoms (see col. 2, lines 9-33, col. 3, lines 30-50, and col. 15, lines 20-40). The above disclosure clearly encompasses applicants claim limitation of the average total number of carbon atoms in R^1 and R^2 for the one or more phosphorous-containing compounds being at least 10.4. The above disclosure also encompasses the recited limitation wherein at least about 80% by weight, which reads on 100% by weight, of the phosphorus present in the lubrication oil composition being present in a compound represented by formula (I) wherein R^1 and R^2 are independently 6 to about 18 carbon atoms.

Applicants' claimed limitation of up to about 40 percent of all the R^1 and R^2 groups supplied by the phosphorus-containing metal salt containing 4 or fewer carbon atoms, reads on zero percent containing 4 or fewer carbon atoms. Accordingly, the limitation is construed as an optional feature which does not further limit the claim.

Roby et al. further disclose the lubricating oil composition comprising: an acylated nitrogen containing compound, including polyisobutene substituted succinimide (see col. 8, lines 45-59, and claim 15), having at least about 10 aliphatic carbon atoms and a total base number which falls within applicants' claimed range (see col. 7, lines 40-50 and, the last line of Example B-3). Roby et al further disclose polyisobutene substituted succinimide which falls in the range of applicant claimed molecular weight range (see col. 8, lines 2-14, and claim 15). Roby et al. further disclose the lubricating oil composition being characterized by a phosphorus concentration of up to about 0.12% by weight, in one embodiment up to about 0.08% by weight (see col. 36, lines 48-50). Regarding the claimed limitation to the substantial absence of copper, since Roby et al. do not disclose copper being present in their final lubricating oil composition, it can be construed that copper is substantially absent from their lubricating oil composition.

(B) Adding the lubricating oil composition to the engine (see claim 43).

(C) Operating the engine (see claim 43).

With respect to applicants' limitation to the process step of (D), since, as shown above, Roby et al. have disclosed a lubricating oil blend within the scope of applicant claimed lubricating oil composition, a lubricating oil composition blended according to the teachings of Roby et al. would possess characteristics, comparable to applicants claimed invention. This is to say that an engine lubricated with a lubricating oil composition blended according to the teaching of Roby et al, would be capable of generating a lean-phosphorous containing gas.

With respect to applicants' claimed limitation to the process step of (E), the limitation is not a patentable distinction over the prior art, as it is well known in the art to equip an internal combustion engine with an emissions control system equipped with a catalyst containing exhaust gas after treatment device, such that the catalyst is contacted with the exhaust gas generated when operating the engine.

Regarding claim 18, Roby et al. disclose a method of lubricating an internal combustion engine, the method comprising:

(A) selecting a lubricating oil composition comprising: a base oil, including natural and synthetic lubricating oils (see col. 34, lines 26-30); an alkali or alkaline earth metal-containing detergent, the alkali or alkaline earth metal including sodium, lithium or calcium (see col. 26, lines 1-4); a metal salt of one or more phosphorus-containing compounds represented by the formula as recited in claim 18 (see col. 15, line 53 to col. 16, line 5), wherein the metal used in the metal salt include zinc (see col. 18, lines 31-35), wherein R^1 and R^2 in the formula are 4-methyl-2-pentyl (see col. 15, lines 20-40).

Roby et al. further disclose the lubricating oil composition comprising: an acylated nitrogen containing compound, including polyisobutene substituted succinimide (see col. 8, lines 45-59, and claim 15), having at least about 10 aliphatic carbon atoms and a total base number which falls within applicants' claimed range (see col. 7, lines 40-50 and, the last line of Example B-3). Roby et al further disclose polyisobutene substituted succinimide which falls in the range of applicant claimed molecular weight

range (see col. 8, lines 2-14, and claim 15). Roby et al. further disclose the lubricating oil composition being characterized by a phosphorus concentration of up to about 0.12% by weight, in one embodiment up to about 0.08% by weight (see col. 36, lines 48-50). Regarding the claimed limitation to the substantial absence of copper, since Roby et al. do not disclose copper being present in their final lubricating oil composition, it can be construed that copper is substantially absent from their lubricating oil composition.

(B) Adding the lubricating oil composition to the engine (see claim 43).

(C) Operating the engine (see claim 43).

With respect to applicants' limitation to the process step of (D), since, as shown above, Roby et al. have disclosed a lubricating oil blend within the scope of applicant claimed lubricating oil composition, a lubricating oil composition blended according to the teachings of Roby et al. would possess characteristics, comparable to applicants claimed invention. This is to say that an engine lubricated with a lubricating oil composition blended according to the teaching of Roby et al, would be capable of generating a lean-phosphorous containing gas.

With respect to applicants' claimed limitation to the process step of (E), the limitation is not a patentable distinction over the prior art, as it is well known in the art to equip an internal combustion engine with an emissions control system equipped with a catalyst containing exhaust gas after treatment device, such that the catalyst is contacted with the exhaust gas generated when operating the engine.

Regarding claim 19, the recited limitation of less than 34 mole percent reads on zero mole percent. Accordingly, the limitation in the claim is construed as an optional feature which does not further limit the method of claim 1.

Regarding claim 24, Roby et al. disclose a method of lubricating an internal combustion engine, the method comprising:

(A) selecting a lubricating oil composition comprising: a base oil, including natural and synthetic lubricating oils (see col. 34, lines 26-30); an alkali or alkaline earth metal-containing detergent; a metal salt of one or more phosphorus-containing compounds represented by the formula (I) as recited in claim 24, wherein in formula (I), X^1 and X^2 are independently O or S, and R^1 and R^2 are independently hydrocarbyl groups, and wherein R^1 and R^2 independently have from about 1 to about 50 carbon atoms (see col. 2, lines 9-33, col. 3, lines 30-50, and col. 15, lines 20-40). The above disclosure clearly encompasses applicants claim limitation of the average total number of carbon atoms in R^1 and R^2 for the one or more phosphorous-containing compounds being at least 10.4. The recited limitation of at least 60 mole % in the claim, reads on 100 mole %.

Accordingly, this limitation is met by Roby et al.

Applicants' claimed limitation of up to about 40 percent of all the R^1 and R^2 groups supplied by the phosphorus-containing metal salt containing 4 or fewer carbon

atoms, reads on zero percent containing 4 or fewer carbon atoms. Accordingly, the limitation is construed as an optional feature which does not further limit the claim.

Roby et al. further disclose the lubricating oil composition comprising: an acylated nitrogen containing compound having at least about 10 aliphatic carbon atoms and a total base number which falls within applicants' claimed range (see col. 7, lines 40-50 and, the last line of Example B-3). Roby et al. further disclose the lubricating oil composition being characterized by a phosphorus concentration of up to about 0.12% by weight, in one embodiment up to about 0.08% by weight (see col. 36, lines 48-50). Regarding the claimed limitation to the substantial absence of copper, since Roby et al. do not disclose copper being present in their final lubricating oil composition, it can be construed that copper is substantially absent from their lubricating oil composition.

(B) Adding the lubricating oil composition to the engine (see claim 43).

(C) Operating the engine (see claim 43).

With respect to applicants' limitation to the process step of (D), since, as shown above, Roby et al. have disclosed a lubricating oil blend within the scope of applicant claimed lubricating oil composition, a lubricating oil composition blended according to the teachings of Roby et al. would possess characteristics, comparable to applicants claimed invention. This is to say that an engine lubricated with a lubricating oil composition blended according to the teaching of Roby et al, would be capable of generating a lean-phosphorous containing gas.

With respect to applicants' claimed limitation to the process step of (E), the limitation is not a patentable distinction over the prior art, as it is well known in the art to equip an internal combustion engine with an emissions control system equipped with a catalyst containing exhaust gas after treatment device, such that the catalyst is contacted with the exhaust gas generated when operating the engine.

5. Claims 2 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roby et al. as applied to claim 1 above, and further in view of Chamberlin et al. (Balancing Crankcase Lubricant Performance with Catalyst Life, SAE, Technical Paper Series 841407, October 8-11, 1984).

Regarding claim 2, as shown in claim 1 rejection above, Roby et al. meet all of the limitations of claim 1. Roby et al. however do not explicitly disclose a weight ratio of detergent metal to phosphorus in the lubrication oil composition. The reference Chamberlin et al. discloses that it is a known practice in the art to select a detergent metal/phosphorus atomic weight ratio of 2.3 or higher to minimize the effects of phosphorus in exhaust emission catalysts (see pg. 9, under the heading, Detergent metal/Phosphorus Ratios). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a weight ratio in the range disclosed in Chamberlin et al. for the purpose of minimizing the effect of phosphorus on emissions systems.

Regarding claims 21-23, as shown in claim 1 rejection above, Roby et al. meet all of the limitations of claim 1. Roby et al. disclose that all of the R¹ and R² groups can be the same or different, and also be selected from groups including secondary alcohols such as isopropyl (see col. 15, lines 20-40). The recited limitation of at least 60 mole % in claims 22 and 23, reads on 100 mole %, accordingly this limitation is met by Roby et al. Roby et al. however do not disclose selecting percentages of R¹ and R² groups having specific carbon atoms as recited in the above respective claims to formulate a lubricating oil composition.

Chamberlin et al. states:

"A test which can evaluate the effects of engine oil formulation variables on emissions system performance may allow for improvements in emissions system longevity within the scope of existing formulation options. This may be the most expedient route to catalyst life extension."

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teachings of Roby et al. and Chamberlin et al., and formulated lubricating oil compositions having varying proportions in the number of carbon atoms, including the claimed proportions, in the R¹ and R² groups of the one or more phosphorus-containing compounds disclosed in Roby et al, provided that the total number of carbon atoms is at least about 8 which is required by the reference Roby et al. (see col. 15, lines 20-30), because Roby et al. disclose that each of the R¹ and R² groups independently can have from about 1 to about 50 carbon atoms. (see col.

2, lines 9-33, col. 3, lines 30-50, and col. 15, lines 20-40). Furthermore, Chamberlin et al. suggests "[a] test which can evaluate the effects of engine oil formulation variables on emissions system performance..". Which motivates on ordinary skill in the art to vary oil formulation variables such as engine oil additives containing phosphorus compounds for the purpose of improving the effects on emissions system.

Conclusion

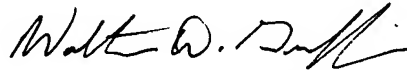
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lessanework T. Seifu whose telephone number is 571-270-3153. The examiner can normally be reached on Mon-Thr 7:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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WALTER D. GRIFFIN
SUPERVISORY PATENT EXAMINER

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